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21 [Array language support for parallel sparse computation](#)

Bradford L. Chamberlain, Lawrence Snyder

June 2001 **Proceedings of the 15th international conference on Supercomputing**
 Full text available: [pdf\(312.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes an array-based language-level approach to parallel sparse computation. Our approach is unique due to its separation of sparse index sets from arrays, both syntactically and in the implementation. This design allows users to express their computation using dense array syntax, making the code easier for readers to understand and for compilers to parallelize and optimize. This work is done within the context of Advanced ZPL, retaining its crisp syntax and source-level perfor ...

Keywords: Advanced ZPL, MPI, NAS parallel benchmarks, parallel computing, parallel language, sparse array, sparse matrix

22 [Towards the effective parallel computation of matrix pseudospectra](#)

C. Bekas, E. Kokiopoulou, I. Koutis, E. Gallopoulos

June 2001 **Proceedings of the 15th international conference on Supercomputing**
 Full text available: [pdf\(589.26 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Given a matrix A , the computation of its pseudospectrum $A \in (A)$ is a far more expensive task than the computation of characteristics such as the condition number and the matrix spectrum. As research of the last 15 years has shown, however, the matrix pseudospectrum provides valuable information that is not included in other indicators. So, we ask how to compute it efficiently and build a tool that would facilitate engineers and scientists to make such analyses? In this paper ...

Keywords: MATLAB, MPI, NOWs, pseudospectra

23 [Optimizing strategies for telescoping languages: procedure strength reduction and procedure vectorization](#)

Arun Chauhan, Ken Kennedy

June 2001 **Proceedings of the 15th international conference on Supercomputing**
 Full text available: [pdf\(193.02 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

terms

At Rice University, we have undertaken a project to construct a framework for generating high-level problem solving languages that can achieve high performance on a variety of platforms. The underlying strategy, called *telescoping languages*, builds problem-solving systems from domain-specific libraries and scripting languages. To accomplish this it extensively preanalyzes and transforms the library to produce a scripting language precompiler that optimizes library calls within the scrip ...

Keywords: Matlab, automatic differentiation, high-level languages, high-performance computing, partial evaluation, procedure specialization, reduction in strength, scripts, specialization, telescoping languages, vectorization

24 [Indexing image databases using wavelet and discrete Fourier transform](#)

Chaman L. Sabharwal, S. R. Subramanya

March 2001 **Proceedings of the 2001 ACM symposium on Applied computing**

Full text available:  [pdf\(773.41 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: compression, discrete fourier transform, image databases, indexing algorithm, wavelet transform

25 [A MATLAB differentiation matrix suite](#)

J. A. Weideman, S. C. Reddy

December 2000 **ACM Transactions on Mathematical Software (TOMS)**, Volume 26 Issue 4

Full text available:  [pdf\(458.56 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

A software suite consisting of 17 MATLAB functions for solving differential equations by the spectral collocation (i.e., pseudospectral) method is presented. It includes functions for computing derivatives of arbitrary order corresponding to Chebyshev, Hermite, Laguerre, Fourier, and sinc interpolants. Auxiliary functions are included for incorporating boundary conditions, performing interpolation using barycentric formulas, and computing roots of orthogonal polynomials. It is demonstrated ...

Keywords: MATLAB, differentiation matrices, pseudospectral methods, spectral collocation methods

26 [A hierarchical combinatorial-Markov model of solving complex reliability models](#)

Robin A. Sahner, Kishor S. Trivedi

November 1999 **Proceedings of 1986 ACM Fall joint computer conference**

Full text available:  [pdf\(980.00 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

27 [A survey of data mining and knowledge discovery software tools](#)

Michael Goebel, Le Gruenwald

June 1999 **ACM SIGKDD Explorations Newsletter**, Volume 1 Issue 1

Full text available:  [pdf\(1.28 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Knowledge discovery in databases is a rapidly growing field, whose development is driven by strong research interests as well as urgent practical, social, and economical needs. While the last few years knowledge discovery tools have been used mainly in research

environments, sophisticated software products are now rapidly emerging. In this paper, we provide an overview of common knowledge discovery tasks and approaches to solve these tasks. We propose a feature classification scheme that can be ...

Keywords: data mining, knowledge discovery in databases, surveys

28 Writing optimization software in APL, J, and MATLAB: a comparison

Richard L. W. Brown

July 1998 **ACM SIGAPL APL Quote Quad , Proceedings of the APL98 conference on Array processing language**, Volume 29 Issue 3

Full text available:  [pdf\(503.31 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Since the appearance of [Karmarkar 1984], interior point methods for linear programming have developed sufficiently to challenge the traditional simplex method, especially on large problems. Moreover, interior point methods generalize to certain types of nonlinear problems that cannot be handled by the simplex method [Ye 1997]. A search of the Internet will reveal a number of software packages that implement interior point methods for linear and nonlinear problems (For example, see [Helmberg 1998 ...

29 A user level program transformation tool

François Bodin, Yann Mével, René Quiniou

July 1998 **Proceedings of the 12th international conference on Supercomputing**



Full text available:  [pdf\(1.02 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: Fortran, interactive program transformations, parallelization, programming environment, tuning

30 FRIDGE: a fixed-point design and simulation environment

H. Keding, M. Willems, M. Coors, H. Meyr

February 1998 **Proceedings of the conference on Design, automation and test in Europe**

Full text available:  [pdf\(148.85 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)
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Digital systems, especially those for mobile applications are sensitive to power consumption, chip size and costs. Therefore they are realized using fixed-point architectures, either dedicated HW or programmable DSPs. On the other hand, system design starts from a floating-point description. These requirements have been the motivation for FRIDGE (Fixed-point pRogrammING DesiGn Environment), a design environment for the specification, evaluation and implementation of fixed-point systems. FRIDGE o ...

Keywords: fixed-point, FRIDGE, quantization, design, simulation, interpolation, interpolative approach, fixed-C, assignment-time instantiation

31 System level fixed-point design based on an interpolative approach

Markus Willems, Volker Bürgens, Holger Keding, Thorsten Grötter, Heinrich Meyr

June 1997 **Proceedings of the 34th annual conference on Design automation - Volume 00**

Full text available:  [pdf\(340.43 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)
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The design process for fixed-point implementations either in software or in hardware requires a bit-true specification of the algorithm in order to analyze quantization effects on an algorithmical level, abstracting from implementation details. On the other hand, system design starts from a floating-point description into a fixed-point description becomes necessary. Within this paper we present a tool that allows an automated, interactive transformation from floating-point ANSI-C into a bit-true specification ...

32 Hierarchical 2-D field solution for capacitance extraction for VLSI interconnect modeling

E. Aykut Dengi, Ronald A. Rohrer

June 1997 **Proceedings of the 34th annual conference on Design automation - Volume 00**

Full text available:  [pdf\(125.45 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

 [Publisher Site](#)

A hierarchical two-dimensional field solution technique is introduced for capacitance extraction for VLSI interconnect modeling. As a basis for compromise between the efficiency of Boolean rules-based extraction and the accuracy of flatfield solution, this hierarchical approach can handle realistic conductor cross-sections and multiple conformal and/or planarized dielectrics.

33 Introduction to SIMAN IV

Cynthia J. Kasales, David T. Sturrock

December 1991 **Proceedings of the 23rd conference on Winter simulation**

Full text available:  [pdf\(537.44 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

34 Introduction to SIMAN (tutorial session)

David T. Sturrock, C. Dennis Pegden

December 1990 **Proceedings of the 22nd conference on Winter simulation**

Full text available:  [pdf\(736.19 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

35 An iterative solution to sparse linear systems on a vector hypercube

L. de Pillis, J. Petersen, J. de Pillis

January 1989 **Proceedings of the third conference on Hypercube concurrent computers and applications - Volume 2**

Full text available:  [pdf\(559.97 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An Intel Hypercube implementation of a new stationary iterative method developed by one of us (JdP) is presented. This algorithm finds the solution vector x for the invertible $n \times n$ linear system $Ax = (I - B)x = f$ where A has real spectrum. The solution method converges quickly because the Jacobi iteration matrix B is replaced by an e ...

36 Introduction to SIMAN

Deborah A. Davis, C. Dennis Pegden

December 1987 **Proceedings of the 19th conference on Winter simulation**

Full text available:  [pdf\(837.11 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper discusses the concepts and methods for simulating manufacturing systems using the SIMAN simulation language. SIMAN is a general purpose simulation language which incorporates special purpose features for modeling manufacturing systems. These special purpose features greatly simplify and enhance the modeling of the material handling

component of a manufacturing system.

37 [Alternatives for modeling of preemptive scheduling](#)

James O. Henriksen

December 1987 **Proceedings of the 19th conference on Winter simulation**

Full text available:  [pdf\(702.08 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A system which includes overt instances of preemptive scheduling, or which requires the use of preemptive scheduling to model the system, can pose difficulties to a modeler. By preemptive scheduling we mean having to reschedule or cancel a previously scheduled event (or activity completion). The difficulties in modeling preemptive scheduling stem from the highly stylized constructs which simulation languages provide for such operations. This paper describes these difficulties, reviews an ap ...

38 [Introduction to SIMAN](#)

C. Dennis Pegden

December 1986 **Proceedings of the 18th conference on Winter simulation**

Full text available:  [pdf\(332.59 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper discusses the concepts and methods of simulating manufacturing systems using the SIMAN simulation language. SIMAN is a general purpose simulation language which incorporates special purpose features for modeling manufacturing systems. These special purpose features greatly simplify and enhance the modeling of the material handling component of a manufacturing system.

39 [Introduction to SIMAN](#)

C. Dennis Pegden

December 1983 **Proceedings of the 15th conference on Winter simulation - Volume 1**

Full text available:  [pdf\(809.32 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)





This paper discusses the concepts and methods for simulating manufacturing systems using the SIMAN simulation language. SIMAN is a new general purpose simulation language which incorporates special purpose features for modeling manufacturing systems. These special purpose features greatly simplify and enhance the modeling of the material handling component of a manufacturing system.

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